

AMENDMENTS IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of the Claims:**

- 1     1 (original). A system comprising:
  - 2             a source of substantially spin-polarized electrons; and
  - 3             a medium which interacts with the spin-polarized electrons, the medium including
  - 4     a spin-dependent quantum well and a layer of semi-conductor material capable of
  - 5     emitting photons.
- 1     2 (original). The system of claim 1, wherein the layer of semi-conductor material
  - 2     comprises a layer of N-type semi-conductor and a layer of P-type semi-conductor
  - 3     coupled so as to form a P-N junction.
- 1     3 (original). The system of claim 2, wherein the P-N junction comprises an electron
  - 2     excited light emitting structure.
- 1     4 (original). The system of claim 3, wherein the layer of semi-conductor material
  - 2     comprises Gallium-Arsenic (GaAs).
- 1     5 (original). The system of claim 4, wherein the spin-dependent quantum well is
  - 2     substantially opaque to the photons emitted, during operation, by the layer of semi-
  - 3     conductor material.
- 1     6 (original). The system of claim 1, wherein the spin-dependent quantum well comprises
  - 2     a layer of layer of magnetic material sandwiched between a first and second layers of
  - 3     spin mirror materials.

1 7 (original). The system of claim 6, further including:

2 a first layer of a electrically conductive material between the first layer of spin  
3 mirror material and the layer of hard magnetic material; and,  
4 a second layer of electrically conductive material below the layer of semi-  
5 conductor material.

1 8 (original). The system of claim 7, wherein the second layer of electrically conductive  
2 material is substantially thin to allow photons emitted, during operation, by the layer of  
3 semi-conductor material to pass through the second layer of electrically conductive  
4 material.

1 9 (original). The system of claim 7, wherein the second layer of electrically conductive  
2 material, at least partially, reflects the photons emitted, during operation, by the semi-  
3 conductor material.

1 10 (original). A method for reading the spin state of a magnetic domain comprising:  
2 directing at the magnetic domain a beam of electrons substantially polarized in a  
3 particular spin state; and  
4 detecting the light emission state of a semi-conductor layer of the magnetic  
5 domain.

1 11 (original). The method of claim 10, wherein detecting the light emission state  
2 comprises capturing at least a portion of the emitted photons utilizing a sensitive photo-  
3 detector.

1 12 (original). The method of claim 10, further comprising determining the state of the  
2 magnetic domain, based in, part upon the light emission state.

1 13 (original). The method of claim 12, wherein determining the state of the magnetic  
2 domain comprises comparing the spin state of the beam of electrons to the light emission  
3 state of the semi-conductor layer.

1 14 (original). The method of claim 12, further comprising trapping a portion of the beam  
2 in the magnetic domain.

1 15 (original). The method of claim 14, wherein determining the state of the magnetic  
2 domain comprises determining what the state of the magnetic domain was prior to  
3 trapping a portion of the beam in the magnetic domain.

1 16 (original). A system for reading data comprising:  
2 a source of spin polarized electrons;  
3 a storage medium disposed a selected distance from the source and having a  
4 plurality of storage locations, each storage location including a magnetic material and a  
5 layer of semi-conductor material capable of emitting photons; and  
6 a photo-detector to detect the emitted photons.

1 17 (original). The system of claim 16, wherein the magnetic material of the storage  
2 location includes a spin-dependent quantum well.

1 18 (original). The system of claim 16, wherein the layer semi-conductor material of the  
2 storage location includes a P-N junction.

1 19 (original). The system of claim 16, wherein the layer semi-conductor material of the  
2 storage location includes Gallium-Arsenic (GaAs).

1 20 (original): The system of claim 16, further comprising a vacuum housing.

1 21 (original): The system of claim 20, wherein the vacuum housing is at least partially  
2 reflective, so as to facilitate the integration of the emitted photons.

1 22 (original): The system of claim 16, wherein the magnetic material of the storage  
2 location is substantially opaque to the photons emitted, during operation, by the layer of  
3 semi-conductor material.

1 Claim 23 – 30 (cancelled).